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Antioxidant Foods

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Abstract: ***Antioxidant is any substance that delays, prevents or removes oxidative damage to a target molecule. It can be found in many foods, including fruits and vegetables. The role of antioxidants in foods is to retard or control oxidation. The process of autoxidation and development of rancidity in foods involves a free radical chain mechanism via initiation, propagation and termination steps. While radicals are produced in the 'initiation' step, they react with unsaturated fatty acids by abstracting a hydrogen atom from a site which requires the least energy that is the allylic or diallylic position in the 'propagation' steps. The reactions in the propagation step make up a chain reaction until a 'termination' reaction occurs. Due to high stability and low volatility, it helps to maintain the level of nutrients, the texture, colour, taste, freshness, functionality, aroma, and appeal to consumers such as the older person. Various antioxidants found in food viz. natural antioxidants, synthetic antioxidants, dietary antioxidant, endogenous antioxidant play an important role in preservation of food. Vitamin C, Vitamin E, α-carotene, Lycopene, Polyphenol etc. is main sources of antioxidants The benefits of antioxidants include whole foods and beverages (e.g., acai berry, gogi berry, green tea) as well as isolated substances sold primarily as dietary supplements (e.g., vitamin C, lycopene, selenium) or added to foods (e.g., vitamin E). It reduces the risk of developing certain diseases such as; cancer, heart disease, stroke, and arthritis etc.***

Introduction

Antioxidants are man-made or natural substances that may prevent or delay some types of cell damage. Diets high in vegetables and fruits, which are good sources of antioxidants, have been found to be healthy; however, research has not shown antioxidant supplements to be beneficial in preventing diseases. Examples of antioxidants include vitamins C and E, selenium, and carotenoids, such as betacarotene, lycopene, lutein, and zeaxanthin. This fact sheet provides basic information about antioxidants, summarizes what the science says about antioxidants and health, and suggests sources for additional information. Antioxidants are man-made or natural substances that may prevent or delay some types of cell damage. Diets high in vegetables and fruits, which are good sources of antioxidants, have been found to be healthy; however, research has not shown antioxidant supplements to be beneficial in preventing diseases. Vegetables and

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fruits are healthy foods and rich sources of antioxidants. Official U.S. Government policy urges people to eat more vegetables and fruits. Concerns have not been raised about the safety of any amounts of antioxidants in food. For more information on antioxidants in foods, visit the U.S. Department of Agriculture Web page on antioxidants and phytonutrients at www.nutrition.gov/whats-food/ antioxidants-phytonutrients.

Antioxidants are man-made or natural substances that may prevent or delay some types of cell damage. Antioxidants are found in many foods, including fruits and vegetables. They are also available as dietary supplements. Examples of antioxidants include:

- Beta-carotene
- Lutein
- Lycopene
- Selenium
- Vitamin A
- Vitamin C
- Vitamin E

Beta-carotene : apricots, asparagus, beets, broccoli, cantaloupe, carrots, corn, green peppers, kale, mangoes, turnip and collard greens, nectarines, peaches, pink grapefruit, pumpkin, squash, spinach, sweet potato, tangerines, tomatoes, and watermelon

Vitamin C: berries, broccoli, Brussels sprouts, cantaloupe, cauliflower, grapefruit, honeydew, kale, kiwi, mango, nectarine, orange, papaya, snow peas, sweet potato, strawberries, tomatoes, and red, green, or yellow peppers

Vitamin A – liver, sweet potatoes, carrots, milk, and egg yolks.

Vitamin E – vegetable oils (such as wheat germ oil), avocados, nuts, seeds and whole grains.

- ***Phenolic compounds:*** Quercetin (apples, red wine, onions), catechins (tea, cocoa, berries), resveratrol (red and white wine, grapes, peanuts, berries), coumaric acid (spices, berries), anthocyanins (blueberries, strawberries)

Vegetables and fruits are rich sources of antioxidants. There is good evidence that eating a diet with lots of vegetables and fruits is healthy and lowers risks of certain diseases. But it isn't clear whether this is because of the antioxidants, something else in the foods, or other factors.

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- Dark chocolate generally speaking the higher the cocoa content the more antioxidants the chocolate contains.
- Pecans are popular nuts rich in minerals health fats and antioxidants they may also help raise blood antioxidant levels and lowers bad cholesterol.
- Blueberries are among sources of antioxidants in the diet they are rich in antocyanis and other antioxidants that may help reduce the risk of heart disease and delay the decline in brain function that happens with age.
- Use of Antioxidant Supplements in the United States A 2009 analysis using data from the National Health and Nutrition Examination Survey (1999–2000 and 2001–2002) estimated the amounts of antioxidants adults in the United States get from foods and supplements. Supplements accounted for 54 percent of vitamin C, 64 percent of vitamin E, 14 percent of alpha- and betacarotene, and 11 percent of selenium intake.

Antioxidants and free radicals

Antioxidants are found in certain foods and may prevent some of the damage caused by free radicals by neutralising them. These include the nutrient antioxidants, vitamins A, C and E, and the minerals copper, zinc and selenium.

Other dietary food compounds, such as the phytochemicals in plants, are believed to have greater antioxidant effects than vitamins or minerals. These are called the non-nutrient antioxidants and include phytochemicals, (such as lycopenes in tomatoes and anthocyanins found in cranberries).

The effect of free radicals

Some conditions caused by free radicals include:

- Deterioration of the eye lens, which contributes to vision loss.
- Inflammation of the joints arthritis
- Damage to nerve cells in the brain, which contributes to conditions (such as Parkinson's or Alzheimer's disease).
- Acceleration of the ageing process.
- Increased risk of coronary heart disease, since free radicals encourage low-density lipoprotein (LDL) cholesterol to stick to artery walls.
- Certain cancers triggered by damaged cell DNA.

Disease-fighting antioxidants

A diet high in antioxidants may reduce the risk of many diseases (including heart disease and certain cancers). Antioxidants scavenge free radicals from the body cells and prevent or reduce the damage caused by oxidation.

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The protective effect of antioxidants continues to be studied around the world. For instance, men who eat plenty of the antioxidant lycopene (found in tomatoes) may be less likely than other men to develop prostate cancer.

Lutein, found in spinach and corn, has been linked to a lower incidence of eye lens degeneration and associated vision loss in the elderly.

Flavonoids, (such as the tea catechins found in green tea) are believed to contribute to the low rates of heart disease in Japan.

Benefits of Antioxidants

1. Reduce the amount of free radicals in our body.

2. Reduce the risk of developing certain diseases such as; cancer, heart disease, stroke, cataracts, Parkinson's, Alzheimer's and arthritis (Phillip, 2012).

3. Prevent direct cell damage caused by the chain reaction that free radicals initiate.

4. Reduce the signs of aging by preventing the oxidation of skin cells.

5. It improves our digestion.

Antioxidants and Health – For some diseases, specific antioxidants might be more effective than the ones that have been tested. For example, to prevent eye diseases, antioxidants that are present in the eye, such as lute in, might be more beneficial than those that are not found in the eye, such as beta-carotene.

—The relationship between free radicals and health may be more complex than has previously been thought. Under some circumstances, free radicals actually may be beneficial rather than harmful, and removing them may be undesirable.

—The antioxidant supplements may not have been given for a long enough time to prevent chronic diseases, such as cardiovascular diseases or cancer, which develop over decades.

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—The participants in the clinical trials discussed above were either members of the general population or people who were at high risk for particular diseases. They were not necessarily under increased oxidative stress. Antioxidants might help to prevent diseases in people who are under increased oxidative stress even if they don't prevent them in other people.

Safety— High-dose antioxidant supplements may be harmful in some cases. For example, the results of some studies have linked the use of high-dose beta-carotene supplements to an increased risk of lung cancer in smokers and use of high-dose vitamin E supplements to increased risks of hemorrhagic stroke (a type of stroke caused by bleeding in the brain) and prostate cancer.

—Like some other dietary

High-dose supplements of antioxidants may be linked to health risks in some cases. For example, high doses of beta-carotene may increase the risk of lung cancer in smokers. High doses of vitamin E may increase risks of prostate cancer and one type of stroke. Antioxidant supplements may also interact with some medicines. To minimize risk, tell you of your health care providers about any antioxidants you use.

Conclusion

Free radicals damage contributes to the etiology of many chronic health problems such as cardiovascular and inflammatory disease, cataract, and cancer. Antioxidants prevent free radical induced tissue damage by preventing the formation of radicals, scavenging them, or by promoting their decomposition. This overview has addressed some key brain-functions associated with dietary choices and the influence of foods on cardiovascular diseases and neurodegenerative disorders like dementias and Alzheimer's disease. We have mentioned food inequalities within a social context in the older person. Further work is needed for coalescing the strands for progress and to address the wellbeing and dietary needs of the future generation of an older person population.

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